

Claims

1-13. (cancelled)

14. (previously amended) A ball grid array (BGA) package, comprising:

a substrate that has a first surface and a second surface;

a stiffener that has a first surface and a second surface, and wherein said second surface of said stiffener is attached to said first surface of said substrate, wherein said stiffener has a plurality of openings formed therethrough that are each open at said first surface of said stiffener and said second surface of said stiffener, wherein an integrated circuit die can be mounted to said stiffener; and

a plurality of solder balls attached to said second surface of said substrate;

wherein said substrate has a window opening that exposes a portion of said second surface of said stiffener;

wherein said exposed portion of said second surface of said stiffener is configured to be coupled to a printed circuit board (PCB); and

whereby a plurality of wire bonds attached to an integrated circuit die can be attached to said first surface of said substrate through said plurality of openings.

15-17. (canceled)

18. (previously amended) The package of claim 14, wherein said stiffener has a centrally-located cavity shaped portion that protrudes through said window opening, wherein a surface of said cavity shaped portion forms at least a portion of said exposed portion of said second surface of said stiffener.

19. (previously amended) The package of claim 18, wherein said surface of said cavity shaped portion is plated with solder that allows said stiffener to be surface mounted to at least one soldering pad on the PCB.

20. (previously amended) The package of claim 14, wherein said stiffener is coupled to a first potential, wherein said package further comprises:
an integrated circuit (IC) die that is mounted to said first surface of said stiffener.

21. (original) The package of claim 20, wherein said IC die has a surface that includes at least one ground pad, wherein said package further comprises:

a ground wire bond corresponding to each of said at least one ground pad,
wherein each said ground wire bond couples said corresponding ground pad to said first surface of said stiffener.

22. (original) The package of claim 14, wherein said substrate is a tape substrate.

23-39. (cancelled)

40. (withdrawn)

41 and 42. (cancelled)

43. (withdrawn)

44-59. (cancelled)

60. (previously added) The package of claim 14, wherein said substrate is an organic substrate.

61 and 62. (cancelled)

63. (previously amended) A ball grid array (BGA) package, comprising:
a stiffener that has a first surface and a second surface, wherein said stiffener has a plurality of openings formed therethrough that are each open at said first surface and said second surface of said stiffener, wherein an integrated circuit die can be mounted to said stiffener;

wherein said second surface of said stiffener is configured to attach to a substrate of the BGA package; and

wherein said stiffener has a cavity-shaped portion that is configured to protrude through a window-shaped opening in the substrate, thereby exposing a portion of said

second surface of said stiffener when said second surface of said stiffener is attached to the substrate; and

wherein a plurality of wire bonds attached to an integrated circuit die can be attached to the substrate through said plurality of openings when the second surface of said stiffener is attached to the substrate.

64. (previously added)The BGA package of claim 63, wherein said exposed portion of said second surface of said stiffener is configured to be coupled to a printed circuit board (PCB).

65. (previously added)The package of claim 63, wherein said stiffener is coupled to a first potential.

66. (previously added)The package of claim 63, wherein said package further comprises:

an integrated circuit (IC) die that is mounted to said first surface of said stiffener.

67. (previously added)The package of claim 66, wherein said IC die is mounted to said first surface of said stiffener in said cavity-shaped portion of said stiffener.

68. (previously added)The package of claim 66, wherein said IC die has a surface that includes a ground signal pad, wherein said package further comprises:

a wire bond that couples said ground signal pad to said first surface of said stiffener.

69. (previously added) The package of claim 66, wherein said IC die has a surface that includes a power signal pad, wherein said package further comprises:

a wire bond that couples said power signal pad to said first surface of said stiffener.

70. (previously amended) A ball grid array (BGA) package, comprising:

a substrate that has a window-shaped opening; and

a stiffener that has a first surface and a second surface, wherein said second surface of said stiffener is attached to said substrate, wherein said stiffener has a plurality of openings formed therethrough that are each open at said first surface and said second surface of said stiffener, wherein an integrated circuit die can be mounted to said stiffener; and

wherein said stiffener has a cavity-shaped portion that protrudes through said window-shaped opening, thereby exposing a portion of said second surface of said stiffener; and

wherein a plurality of wire bonds attached to an integrated circuit die can be attached to said substrate through said plurality of openings.

71. (previously added)The BGA package of claim 70, wherein said exposed portion of said second surface of said stiffener is configured to be coupled to a printed circuit board (PCB).

72. (previously added)The package of claim 70, wherein said stiffener is coupled to a first potential.

73. (previously added)The package of claim 70, wherein said package further comprises:

an integrated circuit (IC) die that is mounted to said first surface of said stiffener.

74. (previously added)The package of claim 73, wherein said IC die is mounted to said first surface of said stiffener in said cavity-shaped portion of said stiffener.

75. (previously added)The package of claim 73, wherein said IC die has a surface that includes a ground signal pad, wherein said package further comprises:

a wire bond that couples said ground signal pad to said first surface of said stiffener.

76. (previously added)The package of claim 73, wherein said IC die has a surface that includes a power signal pad, wherein said package further comprises:

a wire bond that couples said power signal pad to said first surface of said stiffener.

77. (previously amended) A stiffener for use in a ball grid array (BGA) package, comprising:

- a first surface that is configured to mount an integrated circuit die;
- a second surface that is configured to attach to a BGA package substrate;
- a plurality of openings formed therethrough that are each open at said first surface and said second surface of said stiffener; and
- a cavity-shaped portion that is configured to protrude through a window-shaped opening in the BGA package substrate when attached, to expose a portion of said second surface;

wherein a plurality of wire bonds attached to an integrated circuit die can be attached to the BGA package substrate through said plurality of openings.

78. (previously added) The stiffener of claim 77, wherein a portion of said second surface is plated to facilitate attachment to a printed circuit board (PCB).

79. (previously added) The stiffener of claim 78, wherein said portion of said second surface is plated with a metal that comprises a solder material.

80. (previously added) The package of claim 14, wherein said stiffener substantially covers said first surface of said substrate.

81. (previously added) The package of claim 80, wherein outer edges of the stiffener are substantially even with outer edges of the substrate.

82. (previously added) The package of claim 63, wherein, when said second surface of said stiffener is attached to the substrate, said stiffener substantially covers a surface of the substrate to which said second surface of said stiffener is attached.

83. (previously added) The package of claim 82, wherein, when said second surface of said stiffener is attached to the substrate, outer edges of the stiffener are substantially even with outer edges of the substrate.

84. (previously added) The package of claim 70, wherein said stiffener substantially covers a surface of said substrate to which said second surface of said stiffener is attached.

85. (previously added) The package of claim 84, wherein outer edges of the stiffener are substantially even with outer edges of the substrate.

86. (previously added) The package of claim 77, wherein, when said second surface of said stiffener is attached to the BGA package substrate, said stiffener substantially covers a surface of the BGA package substrate to which said second surface of said stiffener is attached.

87. (previously added) The package of claim 86, wherein, when said second surface of said stiffener is attached to the BGA package substrate, outer edges of the stiffener are substantially even with outer edges of the BGA package substrate.